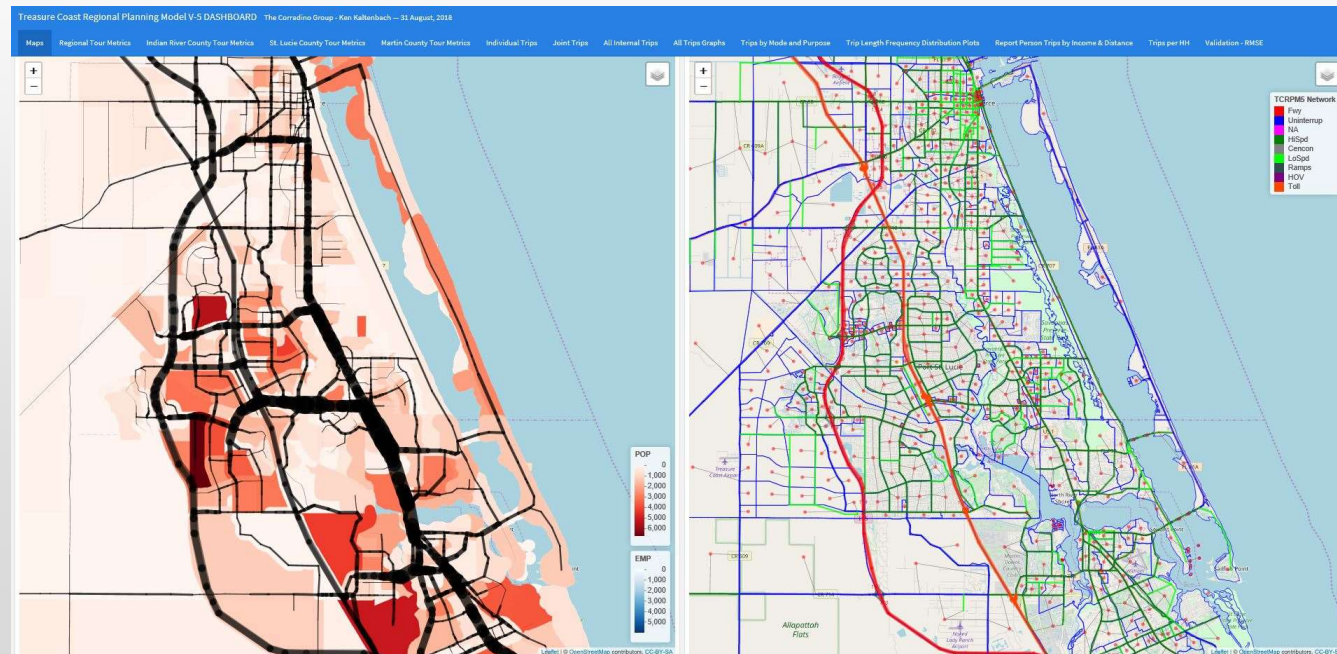# Treasure Coast Regional Planning Model Version 5 Dashboard
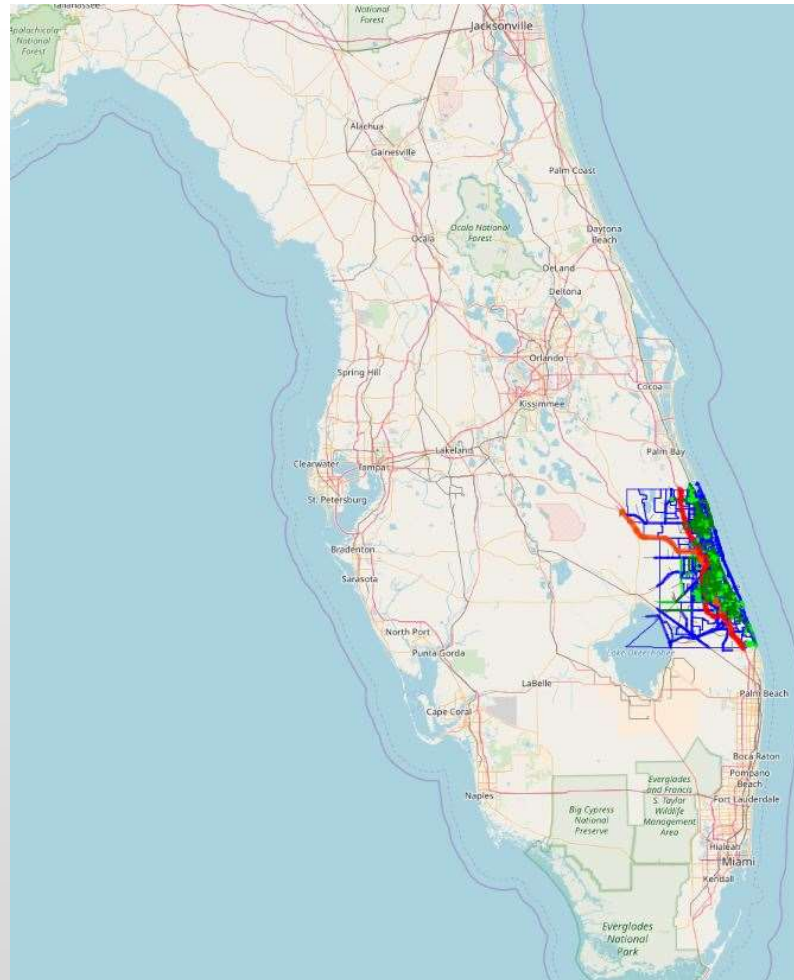
CATMUG

9/05/2018

**The Corradino Group, Inc.**

Location Map

Purpose and Motivation

- Visualize and Display Activity-Based-Model Output
- Make it Easy and Routine – Standard Model Reporting
- Introduce New Software and Methods
- Provide a "starting point" for New Reporting Standards
- Output=html
    - Screen
    - Web
    - Reports
- Development not yet complete – a work in progress, but all tools and methods have been "proven".

Treasure Coast Regional Planning Model Version 5

- Cube Voyager Framework
  - 2015 Base Year, updated from 2010 (Version 5)
  - New HH Survey for model design, estimation, calibration and validation

- CTRAMP ABM
  - Second ABM version for TCRPM.
  - Relatively small area – runs on a laptop (i7, 500GB disk, 16 GB ram).
    - Population = 575,000
    - # TAZ's = MAZ's = 1,100
  - Includes all ground modes

- Overs Three Counties (north of Palm Beach County)
  - User-friendliness & visualization emphasis
  - Provide tools to use the ABM data.
  - Widely used by 3 MPO's, FDOT, and Consultants
  - "Pushed out" to the planning and modeling community
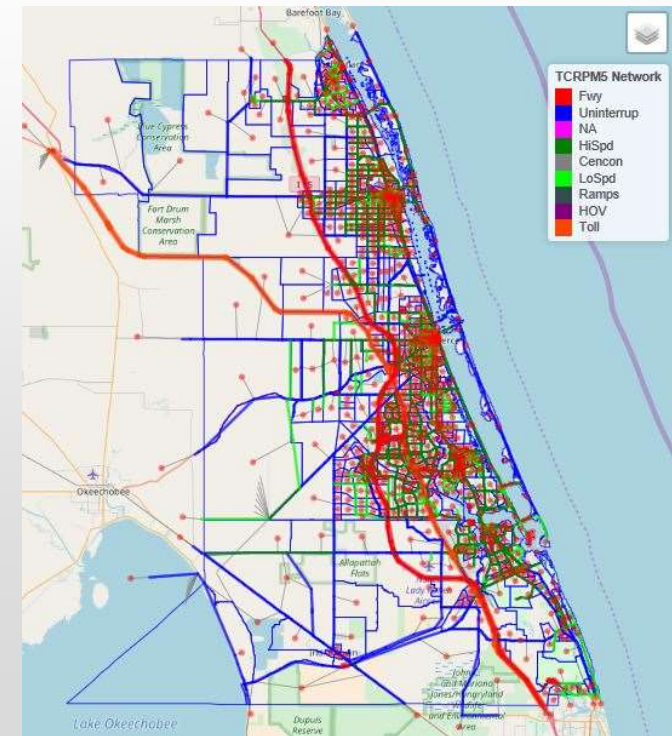
Dashboard Framework

- R and R Studio (all free and open-source)
- rMarkdown
- Flexdashboard
- Ggplot2
- Ploty
- Leaflet & Open Street Map
- Reads ArcMap mapping files (shape & geodatabase)
- Data from CUBE Voyager as comma-delimited files
- Called directly from the Cube flowchart

- Simple "calling" method from Cube "Pilot":

*c:\tcrpm4\dashb\rmtest c:/tcrpm4/dashb/tcrpm5-dash.Rmd c:/tcrpm4/dashb/tcrpm5-dash.html {year}{ALT} c:/tcrpm4 {SAMPLERATE}

Maps

- Demographic Themes (input & popsyn)
  - Household data
  - Auto availability
  - Employment

- Network Displays (input and assignment results)
  - Links
  - Nodes
  - Centroids
  - Flows, Counts, V/C

- Open Street Map Base
- Not a replacement for GIS
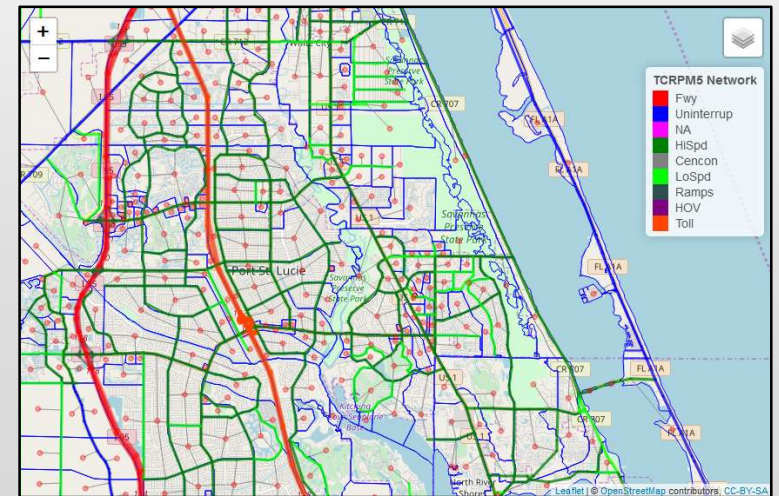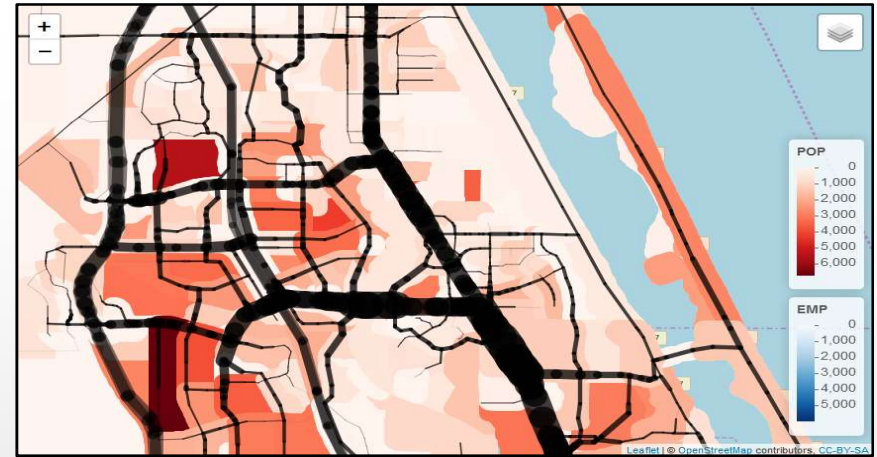
CTRAMP ABM OUTPUT

- From the Population Synthesizer
  - Household Data
  - Person File
- MAZ data (employment, visitors)
- From the Activity Based Model
  - Individual tours, trips
  - Joint tours, trips
  - Visitor tours, trips

- Non-ABM Trips
  - External
  - Airport

"Plotly" tables allow "live" mouse-over annotation.

- ## Example: Individual Trips

% of Individual Person Trips by Purpose & Period

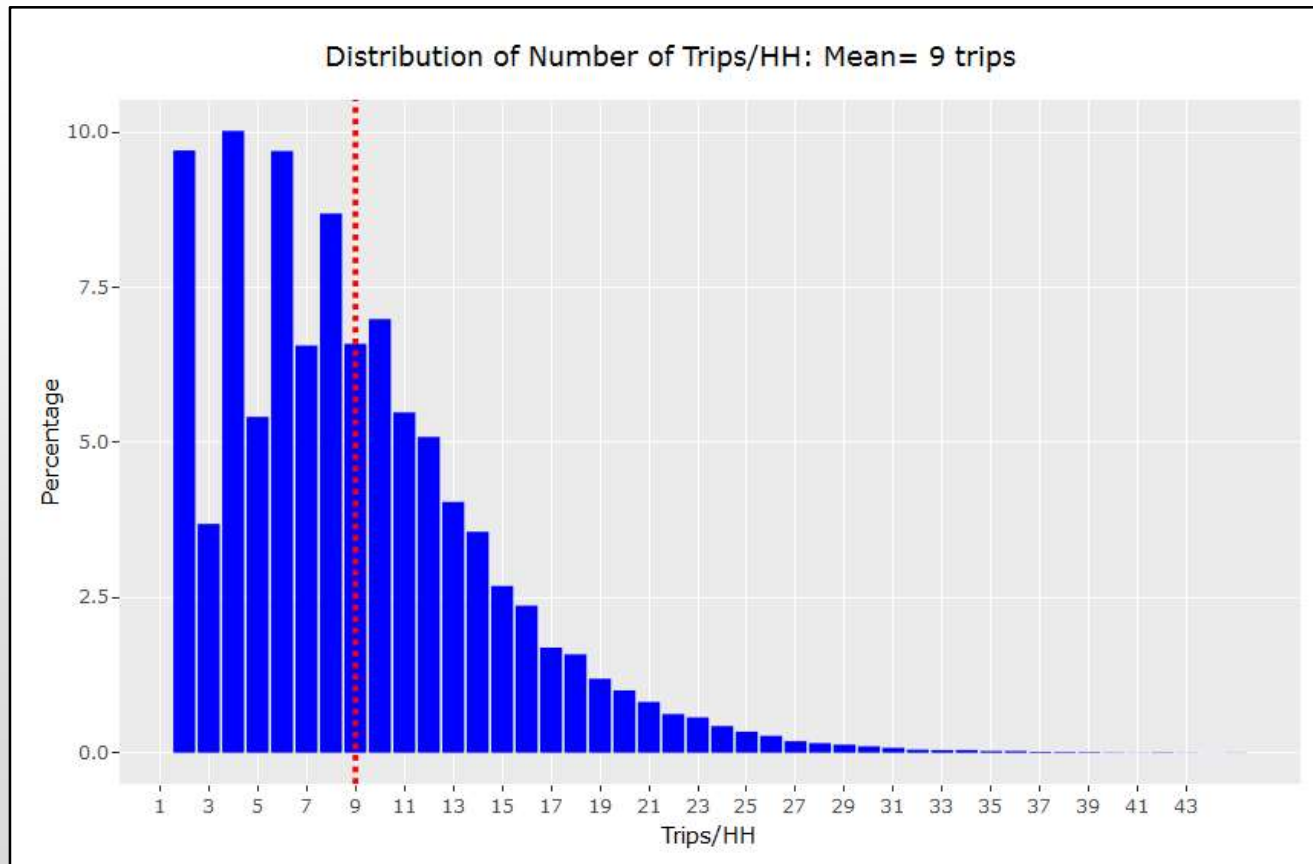| Purpose	Period					
	Early	AM	Midday	PM	Evening	Total
HBW	7.44	31.62	21.15	33.84	5.96	100.01
HBUniv	4.18	22.12	39.83	24.12	9.74	99.99
HBSchool	2.09	49.24	14.01	33.31	1.35	100.00
HBO	4.13	11.59	39.95	33.70	10.62	99.99
NHB	3.35	8.24	42.47	37.11	8.83	100.00
NHBW	4.40	20.87	34.62	34.41	5.69	99.99

Individual Person Trips by Purpose in Each Period
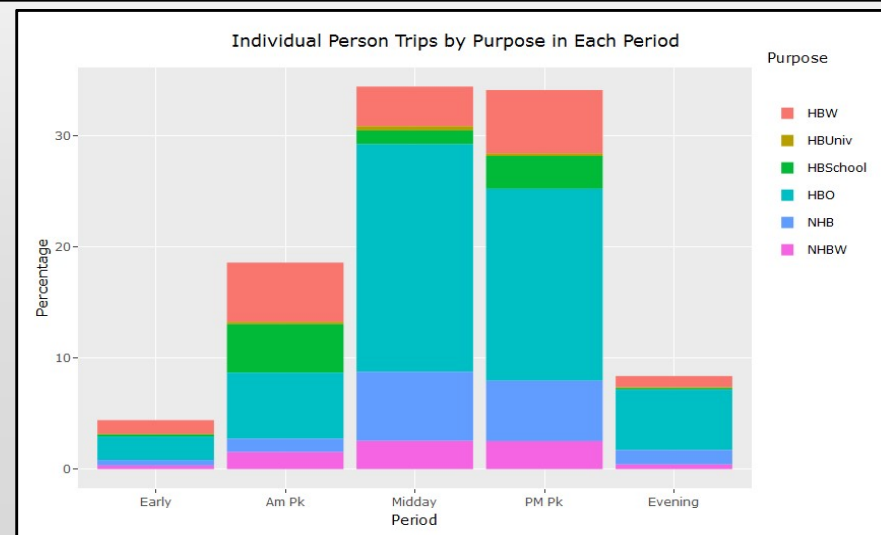
Trips (purposes translated to traditional trip purposes for comparison)
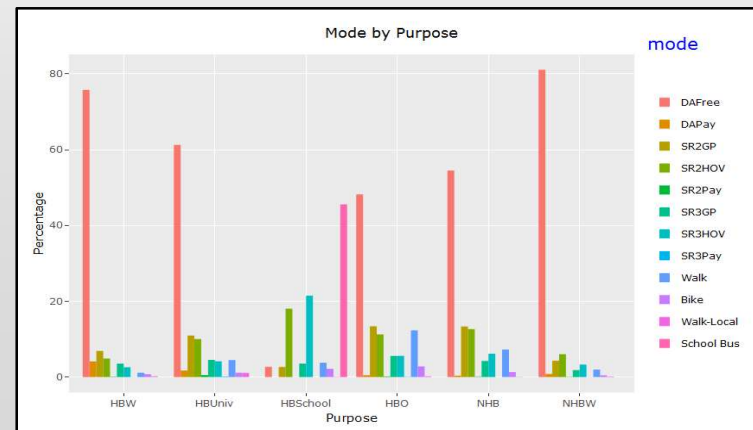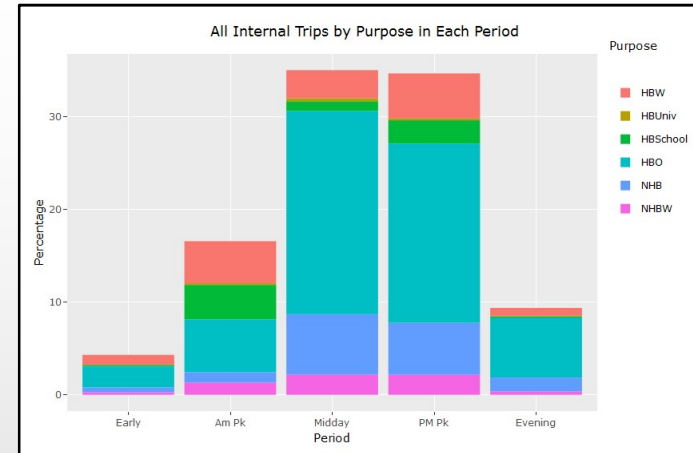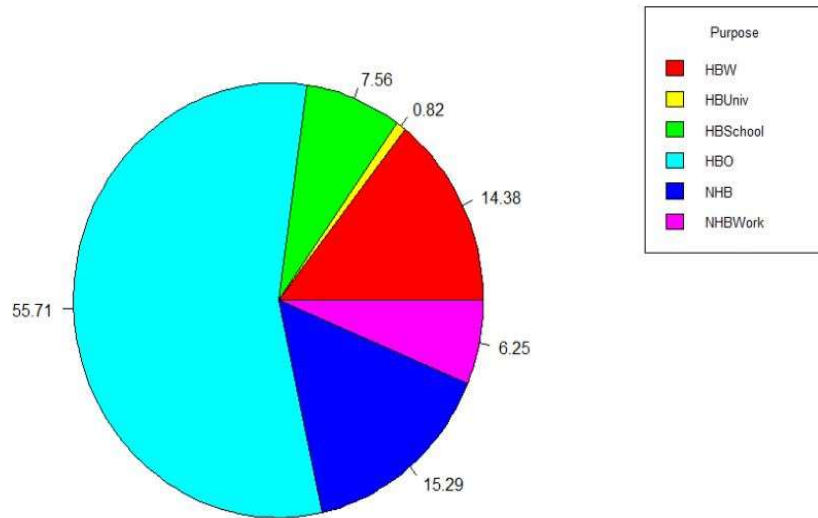
Trips per Household

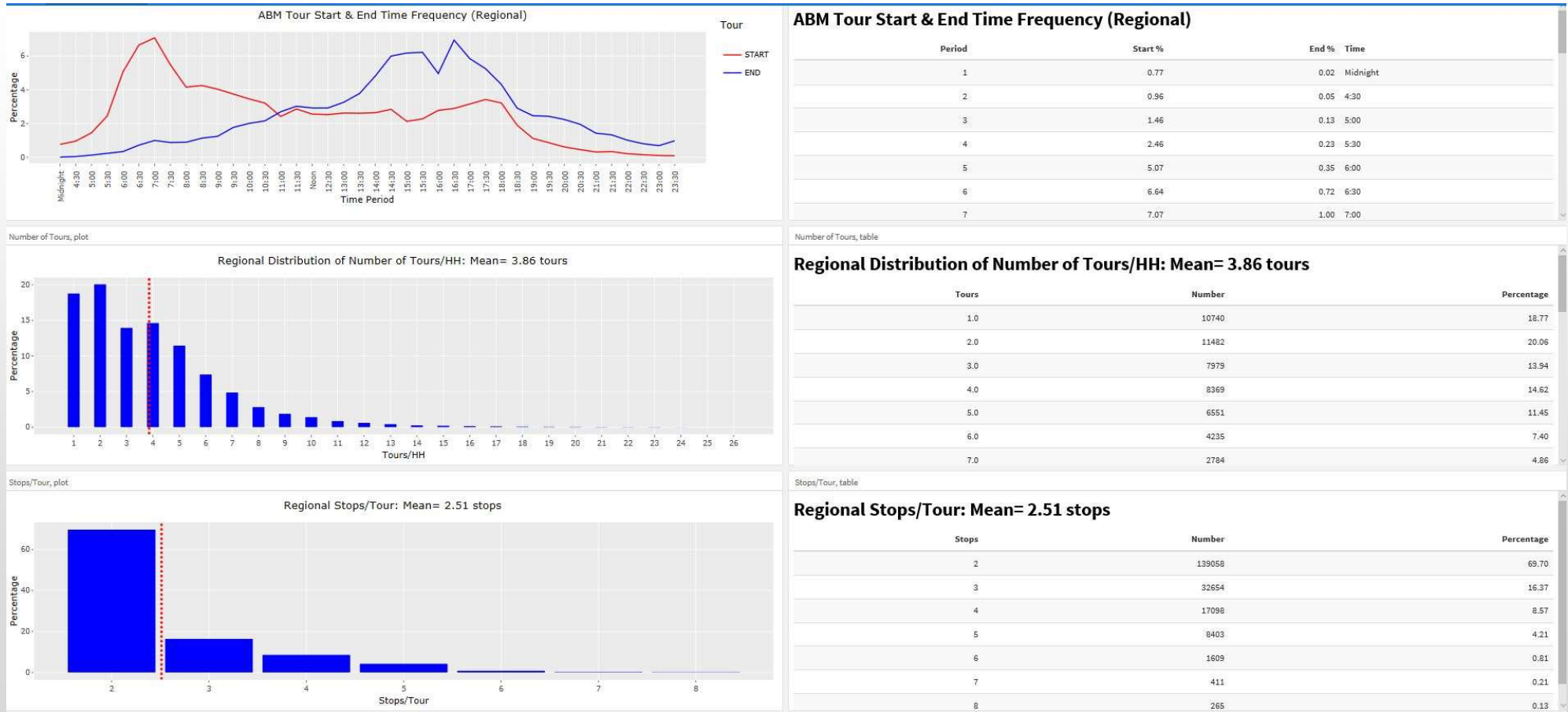Distribution of Number of Trips/HH: Mean= 9 trips

Trip Length Frequency Distribution (from destination choice)

All trips

By Income Group
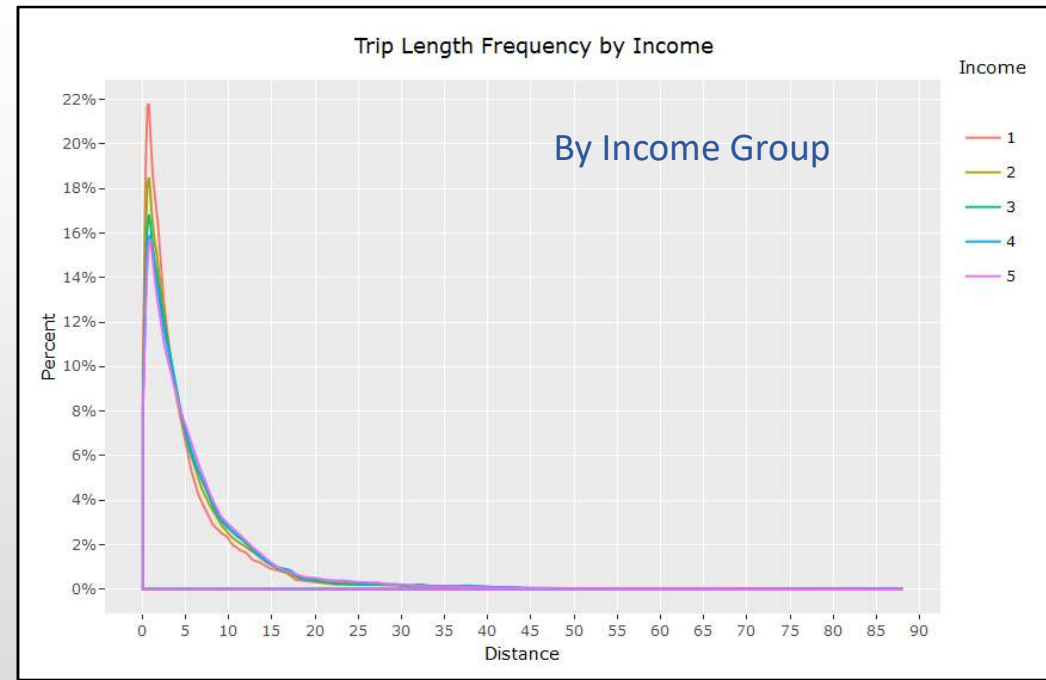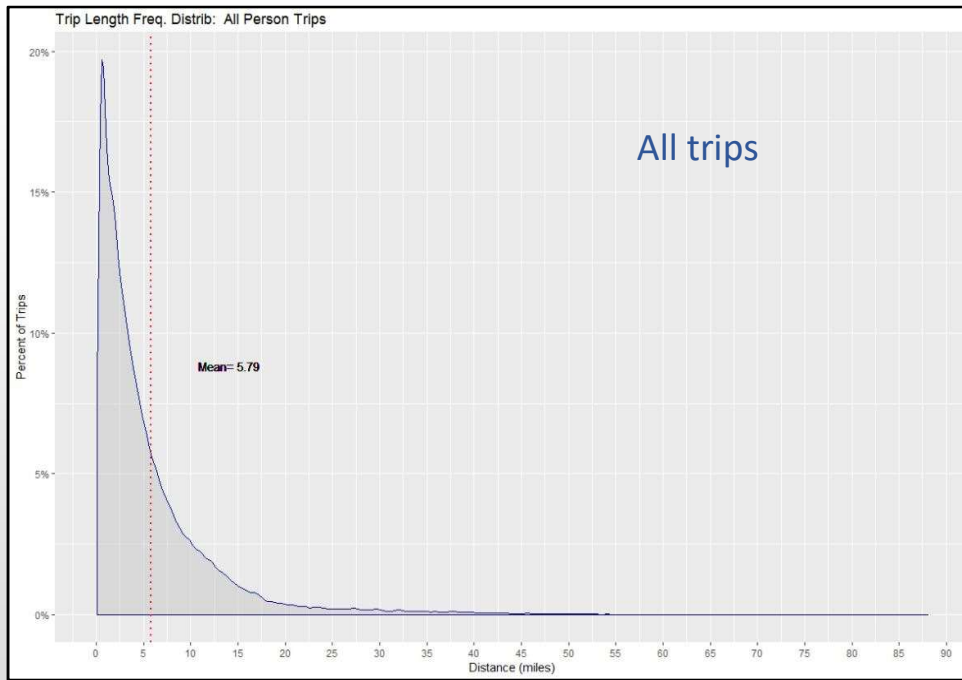
ABM Tour Output (<u>Regional</u>, County-specific, Tour purpose)

ABM Tour Output (Regional, County-specific, Tour purpose)

Model Validation

Regionwide Root-mean-square error

Volume Group	Count	Volume	%RMSE	MaxVolume	RMSE Limit
1	2,322,840	2,576,009	53.36	5,000	55
2	2,360,278	2,277,764	32.57	10,000	45
3	2,327,284	2,244,833	22.31	20,000	35
4	1,116,904	1,170,157	18.05	30,000	27
5	387,000	383,950	12.76	40,000	24

Root Mean Square Error by Volume Group

Count - Model Assignment Comparison
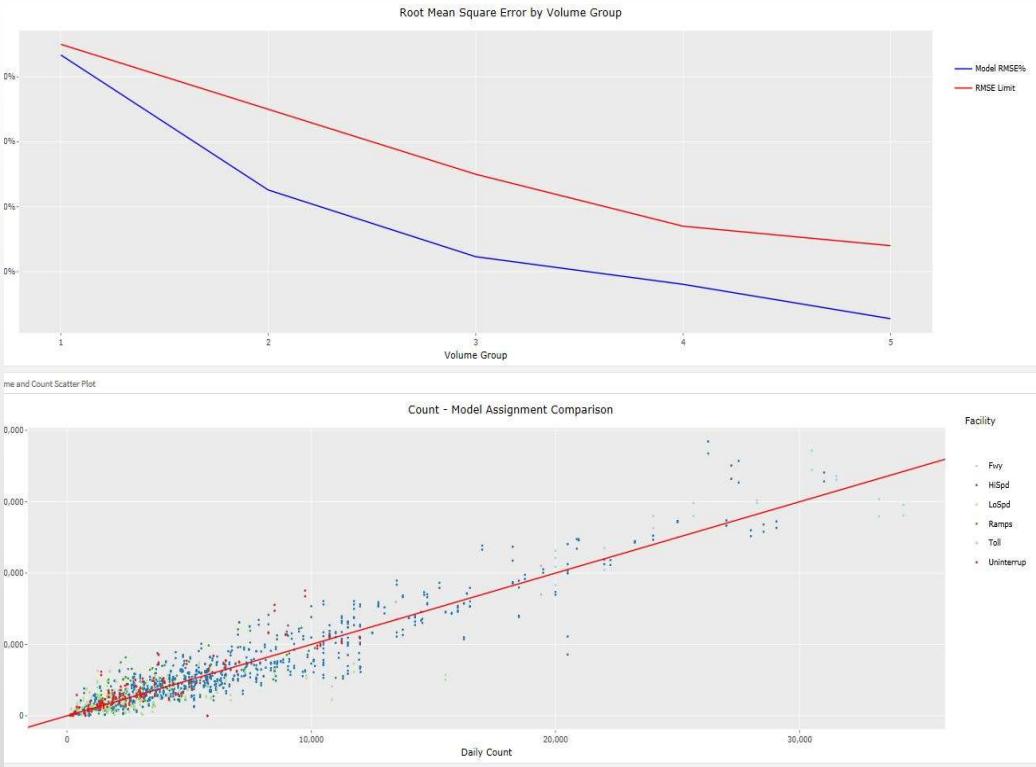
More to come!

- Replace most (or all) Cube Matrix reports with R-based reports
- Expand transit, managed lane, HOV reporting
- Create more map displays
- Add many more ABM Data reports
- Create interactive reports using "Shiny"

Thank You